

REMARKS

Claims 1-36 are pending in this application. Claims 1, 11-13, 16, 17, 19, 20, 24 and 25 have been amended herein. New claims 26-36 have been added herein.

The amendments to claims 1, 11-13, 16, 17, 19, 20, 24 and 25, and the presentation of new claims 26-36, are for clarity, as discussed below.

Claims 5-6 and 8-10 are objected to (Office action paragraph 1).

The rejection of claims 5-6 and 8-10 is respectfully traversed.

The Examiner states that the word “glost” is misspelled. Applicants assert, however, that the term “glost” is not misspelled. The term “glost firing” is a well known term of the art. In demonstration of this point, Applicants have attached a copy of a page from Singer, F. and Singer, S.S., Industrial Ceramics, Chapman & Hall, London, 1963, explaining the term “glost firing.”

Claims 18-23 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make or use the invention (Office action paragraph 4).

The rejection of claims 18-23 is respectfully traversed.

The Examiner states that “there is no description of how to make the overcoat layer.” However, the term “overcoat layer” does not appear in claims 18-23. Applicants believe that the recitation of claims 18-23 is fully enabled by the specification.

Applicants also note that the specification uses the term “overcoat layer” in paragraph [0042], specifically on page 23, line 2.

Claims 18-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite (Office action paragraph 5).

The rejection of claims 18-23 is respectfully traversed.

The Examiner states that “it is not clear what the overcoat layer is comprised of.” Applicants again note that the claims do not recite an “overcoat layer”. Moreover, Applicants also note that there is no requirement that the claims recite what each recited component “is comprised of.”

Claims 1-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite (Office action paragraph 6).

The rejection of claims 1-25 is respectfully traversed.

First, the Examiner states that “it is unclear as to how glass is inserted placed between the coloring material and the water-soluble adhesive.” First of all, the claims do not use the term “inserted” at all. Moreover, the “water-soluble adhesive” is not recited until claim 18, so this aspect of the rejection presumably applies to claims 18-25. However, claim 18 is a structural claim, not a method claim. Applicants therefore respectfully assert that “how glass is inserted” cannot be an issue for a rejection under 35 U.S.C. 112, second paragraph.

Secondly, the Examiner states that “it is confusing as to what layer the coloring material is on, the glass or the adhesive.” Applicants again note that this can only apply to claims 18-25, where

the water-soluble adhesive layer is recited. In response, Applicants note that claim 18 clearly recites that the raised coloring material is on the **adhesive layer** (see page 38, lines 4-5).

Thirdly, the Examiner states that “in claim 18, it is unclear what the phrase ‘present position’ means.” Applicants respectfully note that claim 18 does not recite “**present** position”, but rather “**preset** position”.

Claims 11-13, 16, 17, 19, 20, 24 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite (Office action paragraph 7).

The rejection is overcome by the amendment to the claims. The ranges designated by “preferably” and “more preferably” have been deleted from the claims and have been presented in dependent claims, without the introductory terms “preferably” and “more preferably”.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite (Office action paragraph 8).

The rejection is overcome by the amendment to claim 1, deleting the phrase “of glass”.

Claims 1-3, 5-17 are rejected under 35 U.S.C. 102(b) as being anticipated by McDaniel (U.S. Patent No. 5,747,153) (Office action paragraph 10).

The rejection of claims 1-3 and 5-17 is respectfully traversed. Applicants submit that there is no disclosure in McDaniel of a structure as recited in claim 1.

With regard to the Examiner’s remarks concerning column 1, lines 50-56 of McDaniel,

Applicants note that these lines only discuss prior art in which pigments are included “in the body of a composition’s glass component” or “ incorporated in a vitreous flux which is applied to a vitreous substrate”. This is clearly different from the recitation of claim 1.

Column 2, lines 50-67, also cited by the Examiner, disclose the substrates that may be used in McDaniel’s method, including glass and glazed ceramics, and discusses vitreous glazes and overglazes. Column 3, lines 2-30, discuss the pigments for use in McDaniel. These lines of the reference are not directly related to the “customary and normal procedure” discussed in column 1, lines 50-56.

Applicants note that McDaniel discloses a method of producing glass and ceramic objects having durable lustrous coatings. The method comprises applying a thin surface coating of an inorganic based luster pigment to the vitreous surface of a ceramic object and thereafter heating the surface to a temperature and time sufficient to fix the pigment to the surface and fuse the surface (column 2, lines 32-36). The substrate having a vitreous surface may be glass or a glazed ceramic. The luster pigments are inorganic-based and have a temperature stability to deformation of at least 800 degrees Fahrenheit (equivalent to 427 °C). The pigments are inorganic platelet-shaped particles with a surface coating of at least one metal oxide layer (column 2, line 66 to column 3, line 4).

The Examiner has not indicated any particular teaching in McDaniel for the recited “intermediate glass layer” between a “glazing layer” and a “raised coloring material layer”. Applicants here assume that the Examiner is taking the vitreous glaze in McDaniel as corresponding to the recited glazing layer. Applicants are uncertain if the luster pigment in McDaniel can be considered to correspond to the raised decorative coloring material including inorganic pigment and

glass flux. However, even if McDaniel is considered to provide these two components of the claims, Applicants cannot find a disclosure in McDaniel corresponding to the “intermediate glass layer.”

With reference to the glass transition temperature limitations of the intermediate glass layer and glass flux in claim 1, the Examiner also states that “the glass transition temperatures of glass and glass flux are inherent properties.” The Examiner then refers to column 4, lines 44-66 of McDaniel, which indicate that the softening point for glass is about 400 °F to 1600 °F (that is, 204 °C to 871 °C), and the Examiner states that this “is included in the Applicant’s range of 450 to 700 °C”.

With regard to the Examiner’s comments about temperatures, Applicants first note that they are uncertain of the meaning or relevance of this statement that “the glass transition temperatures ... are inherent properties”. Clearly, glass transition temperatures vary between different materials, and claim 1 recites specific limitations for the glass transition temperatures of two distinct structural components. McDaniel does not appear to teach or suggest these limitations, and there is no indication that any of McDaniel’s components would inherently have the recited limitations.

The Examiner then refers to column 4, lines 44-66, of McDaniel, which indicate that the softening point for glass is about 400 °F to 1600 °F (that is, 204 °C to 871 °C), and the Examiner states that this “is included in the Applicant’s range of 450 to 700 °C”. Even if “softening point” is taken to be equivalent to “glass transition temperature”, it is clear that the recitations of a range of 450 °C to 550 °C for the glass transition temperature of the intermediate glass layer and the range of 550 °C to 700 °C for the glass flux, in claim 1, are much **narrower** than McDaniel’s general disclosure of the range of glass softening temperature. Therefore, the temperature range limitations of the present claims cannot be anticipated by this disclosure.

The Examiner then discusses column 1, lines 50-56, of McDaniel as teaching the “in-glaze decoration process.” Applicants respectfully disagree. Claim 1 recites “an in-glaze decoration raised ceramic article ...” with particular structural limitations, while these lines of McDaniel simply disclose that pigments may be incorporated into the body of a glass component or into a vitreous flux. In addition, in regard to the Examiner’s comments about claim 1 being a “product-by-process”, the term “in-glaze decoration” is a product-by-process limitation in claim 1 only to the extent that it is “formed on a surface of a ceramic substrate layer, using a raised coloring material including inorganic pigments(s) and glass flux”. The remainder of the claim is purely structural in recitation.

Claim 1 distinctly recites three layers of the ceramic article: a glazing layer, an intermediate glass layer and a raised coloring material layer. Moreover, specific limitations are recited on the intermediate glass layer and on the composition of the raised coloring material layer (with regard to the glass flux in this layer). Applicants respectfully assert that the Examiner has not addressed these limitations of the claims, and Applicants cannot find these disclosed in McDaniel.

Regarding claim 2, the Examiner cites McDaniel’s disclosure of a thickness of the particles of pigment in the luster pigment, which are 1 to 180 microns in length and width and 0.1 to 3 microns in thickness. However, this is not a disclosure of the thickness of the layer formed from the luster pigment in the as-fired state. Applicants note that the luster pigment is applied to give a coating thickness of 0.1 to 25 microns (column 3, lines 47-51; column 5, line 12), this being before firing. Note that greater than 25 micron coatings appear to be impossible in McDaniel (column 5, line 13): “further overlapping of the luster pigments cannot take place” Even if this thickness were to correspond to the as-fired value, this disclosed range in McDaniel only somewhat overlaps

the recited “as-fired” value in claim 2 (20 to 250 μm) and could not anticipate the recited range.

The Examiner has rejected claim 3, but refers to no relevant teaching from McDaniel. Applicants note again that McDaniel does not appear to recite a glass layer.

Regarding claims 5, 6, and 8-10, Applicants respectfully disagree with the Examiner that “the firing temperature of the ceramic substrate is not germane.” These claims recite a product-by-process limitation that affects the structure of the article, and the Examiner must give a basis in fact or technical reasoning that the prior art would have the same structure (see MPEP 2112).

Applicants therefore assert that claims 1-3 and 5-17 are not anticipated by McDaniel. These remarks also apply to claims 26-31.

Claims 4, 13, 15, 16 and 18-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over McDaniel (U.S. Patent No. 5,747,153) in view of Lin (U.S. Patent No. 5,370,913) (Office action paragraph 12).

The rejection of claims 4, 13, 15, 16 and 18-25 is respectfully traversed.

The Examiner states that McDaniel discloses the invention except for the “glass thicknesses of claims 4, 13, 15, 16, 21, 23 and 24.” However, Applicants have noted above that McDaniel does not disclose the limitations of independent claim 1. These arguments are similarly applicable to independent claim 18, which, first of all, is a transcription sheet; McDaniel does not appear to discuss transcription sheets. Claim 18 also recites a water-soluble adhesive layer formed on a base sheet, for which Applicants find no teaching in McDaniel.

With regard to the “glass thicknesses”, we note that claims 4, 15, 16, 23 and 24 recite

limitations on the glass layer or intermediate glass layer. However, claims 13 and 21 recite limitations on the thickness of raised coloring material.

Applicants have noted above that McDaniel does not disclose a glass intermediate layer. The Examiner has indicated no teaching in Lin that would suggest modifying McDaniel to have a glass intermediate layer. The Examiner refers only to Lin, column 1, lines 24-30, which disclose laminating a glass with an adhesive sheet of resin film.

The Examiner then refers to Lin's teaching a transcription sheet in Figures 1-4. However, Lin does not mention "transcription" and Lin's teaching of paper 3 (column 4, line 44) is **not** a disclosure of a transcription sheet. Moreover, Lin's conventional ceramic color frit is not a flux.

Lin discloses a **laminated ornamental glass article** which has two transparent substrates 1, 4. **A layer of resin film or paper 3 with glazed painting or stripe figures printed or coated thereon**, is positioned between the two adhesive layers 2. That is, **"two layers of resin adhesive 2"** are essential in Lin. Thus, this is not a ceramic article as a whole, and Applicants submit that Lin is generally unrelated to the present invention.

Applicants therefore assert that claims 4, 13, 15, 16 and 18-25 are novel and non-obvious over McDaniel and Lin, taken separately or in combination. These remarks also apply to new claims 28-36.

Claims 18-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanco et al. (U.S. Patent No. 3,956,558) in view of McDaniel (U.S. Patent No. 5,747,153) (Office action

paragraph 13).

The rejection of claims 18-25 is respectfully traversed.

In traversing the rejection Applicants note again that McDaniel does not provide the transcription sheet of claim 18.

Blanco generally relates to an overglaze decalomania containing a prefused low melting point glass flux or frit to form a protective layer for giving resistance to both acid and alkali attack for inhibiting release of lead, Cd. and other toxic substances. Blanco does not provide the limitations of claim 18 and does not cure the deficiencies of McDaniel.

Applicants respectfully assert that claims 18-25 are novel and non-obvious over Blanco and McDaniel, taken separately or in combination. These remarks also apply to new claims 32-36.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Attached hereto is a marked-up version of the changes made by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"


Amendment under 37 CFR 1.111
Hiromichi HAYASHI et al.

U.S. Patent Application Serial No. 09/892,895
Attorney Docket No. 010845

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 1, 11-13, 16, 17, 19, 20, 24 and 25.

1.(Amended) An in-glaze decoration raised decorative ceramic article having a raised coloring material layer obtained on in-glaze decoration on a glazing layer formed on a surface of a ceramic substrate layer, using a raised coloring material including inorganic pigment(s) and glass flux, said in-glaze coloring raised decorative ceramic article comprising:

an intermediate glass layer ~~of glass~~ with a glass transition temperature of 450°C to 550°C between said glazing layer and the raised coloring material layer;

said glass flux in said raised coloring material having a glass transition temperature ranging between 550°C and 700°C.

11. (Amended) The ceramic article as defined in claim 1, wherein said glass transition temperature of the glass flux in said raised coloring material is 570 to 680°C, ~~preferably 600 to 660°C~~.

12. (Amended) The ceramic article as defined in claim 1, wherein said glass transition temperature of the glass in said glass layer is 470 to 530°C, ~~preferably 490 to 520°C~~.

13. (Amended) The ceramic article as defined in claim 1, wherein said raised coloring material layer has a thickness of 50 to 200 μm , ~~preferably 80 to 150 μm~~ , after the firing.

16. (Amended) The ceramic article as defined in claim 1, wherein said intermediate glass layer has a thickness of 1 to 40 μm , ~~preferably 3 to 30 μm , more preferably 5 to 20 μm~~ after firing.

17. (Amended) The ceramic article as defined in claim 1, wherein said glass transition temperature of the glass flux in said raised coloring material is by at most 100 °C, ~~preferably by at most 75°C~~, higher than that of the glass in said intermediate glass layer.

19. (Amended) The transcription sheet as defined in claim 18, wherein said glass transition temperature of the glass flux in said raised coloring material is 570 to 680°C, ~~preferably 600 to 660°C~~.

20. (Amended) The transcription sheet as defined in claim 18, wherein said glass transition temperature of the glass in said glass layer is 470 to 530°C, ~~preferably 490 to 520°C~~.

24. (Amended) The transcription sheet as defined in claim 18 wherein said intermediate glass layer has a thickness of 1 to 40 μm , ~~preferably 3 to 30 μm , more preferably 5 to 20 μm~~ after firing.

25. (Amended) The transcription sheet as defined in claim 18, wherein said glass transition temperature of the glass flux in said raised coloring material is by at most 100°C, ~~preferably by at most 75°C~~, higher than that of the glass in said intermediate glass layer.